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ABSTRACT

This monograph describes the program of the Language and Cognitive Development Center (Massachusetts), which serves toddlers and school-aged children with autism or other pervasive developmental disorders (PDD). An introduction presents incidence figures, the program's philosophy, the program's approach to assessment, intervention with children having limited reality systems, approaches to generalization of training, dealing with behavior problems, and the program's unique approach to teaching language. Next, a discussion of cognitive-developmental systems theory examines child development in terms of the sign stage of development (0-18 months), formation and dynamics of reality systems during the sign stage, and the development of intention during the sign stage. Intervention is then considered, including the program's "Umwelt" approach to the evaluation of reality systems, correcting developmental dysfunctions, developing body schema, coping with surroundings, developing social contact, and developing communication and representation skills. The integration of skills learned in the Center into the home environment is then explained. A final discussion answers questions concerning the curriculum for school-age nonverbal or limited verbal PDD children, examines determinants of child success, and offers evidence of the program's success (48 percent of Center children have returned to the public school mainstream for all or part of their classes). (Contains 53 references.) (DB)

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THE LANGUAGE AND COGNITIVE DEVELOPMENT CENTER, INC.

A NEW WAY WITH AUTISTIC AND OTHER CHILDREN WITH PERVASIVE DEVELOPMENTAL DISORDERS

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THE LANGUAGE AND COGNITIVE DEVELOPMENT CENTER

The Language and Cognitive Development Center (LCDC) is both a Massachusetts Public Law 766 approved school for special needs children as well as a Massachusetts Public Health Licensed Clinic. It is also approved by the American Psychological Association and the American Speech and Hearing Association and other professional groups to provide continuing education courses, workshops and seminars for professionals interested in its unique approach. LCDC regularly receives referrals from Boston's Children's Hospital, Tufts New England Medical Center, Franciscan Hospital, Massachusetts General Hospital, Boston City Hospital and the Boston School Department. It accepts for training students from a broad range of disciplines from Clark University, Northeastern University, Boston University, Harvard University, Simmons College, Lesley College and, recently, from the University of Puerto Rico and Tel Aviv University.

LCDC'S PROGRAMS

The Center's day school serves children ages 3 to 14; its Toddler Clinic Program serves children under 3. The Center maintains a satellite program in North Reading (LCDC at SEEM Collaborative) and is establishing other satellites south and west of Boston. The Center's staff of 55 represents all relevant disciplines. For further information see the section on PROGRAMS AND MATERIALS.

DISSEMINATION OF LCDC'S PROGRAM

LCDC has been awarded two major demonstration grants from the United States Department of Education's Bureau of Education for the Handicapped to demonstrate and disseminate its unique program for toddlers and school age children with autism and other pervasive developmental disorders (PDD) to schools, hospitals, clinics and parents working with this population. Recently, a grant from the American Legion Child Welfare Foundation has extended this effort through distribution of this pamphlet to 75,000 professionals and parents providing services for these children.

ABOUT THE AUTHORS

Arnold Miller, Ph.D., is Executive Director of the Language and Cognitive Development Center, (LCDC), and Affiliate Professor of Psychology, Clark University. **Eileen Eller-Miller, M.A., C.C.C.**, speech and language pathologist, is Education Director of the Center. The Millers founded LCDC in 1965 and have published articles and presented workshops and video documentaries of their work on children with pervasive developmental disorders both in this country and abroad. Their most recent collaboration has led to the book: *From Ritual to Repertoire: A Cognitive-Developmental Systems Approach with Behavior Disordered Children*, John Wiley and Sons, 1989.

A New Way With Austistic and Other Children With Pervasive Developmental Disorders

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INTRODUCTION

Given 15 out of every 10,000 children who develop autism and other pervasive developmental disorders (PDD), there are approximately 375,000 such children in the United States alone. However, when one takes into account the impact that autistic and other PDD children have on their immediate and extended families, as well as on schools, clinics and hospitals, the numbers of people affected goes into the millions.

PDD children often challenge family and community resources to the limit. The problem of how to "be" with a child who often gives back little and behaves at times in frightening and unpredictable ways poses serious dilemmas. Frequently marriages are affected, and siblings feel neglected because of the parents' preoccupation with the disordered child. Often grandparents or other relatives add to the problem either by asserting that nothing is wrong or by directly or indirectly implying poor parenting of the child. Sometimes professionals unfamiliar with these disorders either inappropriately reassure the parents that the problem will resolve itself or, alternatively, inform the parents that their child is hopeless and can never develop.

Over the past 25 years the Language and Cognitive Development Center's Cognitive-Developmental (C-D) Systems Approach has helped many children with PDD develop more normally. We write this pamphlet so professionals and parents may help many more children. In the following pages we respond to frequently posed questions:

What is the philosophy behind the Cognitive-Developmental Systems Approach?

We maintain that each child – no matter how withdrawn or disorganized – is trying to find a way to cope with the world. Our task is to help that child use every capacity or fragment of capacity to achieve this.

Because the ability to assess and respond to the outside world is essential for survival, we have developed specialized training systems and instructional equipment to help make this possible. Because the ability to understand others and to express oneself is fundamental, we have developed methods for teaching communication through signed and spoken language. And because a disordered child affects all around him, we work closely with parents and families to create a supportive but sufficiently demanding home life so that new capacities to cope that have begun to flourish at the Center may generalize to home and elsewhere.

How do you assess the children?

Our assessment examines the unique way in which each disordered child experiences reality. We observe the manner in which the child reacts or fails to react to different parts of a situation. Figure 1 below indicates what we mean.

Figure 1a represents a child enjoying a repetitive pushing-ball game in which adult and child push a swinging ball back and forth. The dotted lines to both ball and adult indicate that the child's reality system includes awareness of both the ball and the adult.

Figure 1b, as the dotted line indicates, reflects a more limited reality system which includes the ball — as shown by his or her pushing it whenever it arrives — but not the adult.

Figure 1c shows an even more circumscribed reality system since here the child fails to react even when the ball bumps into him or her.

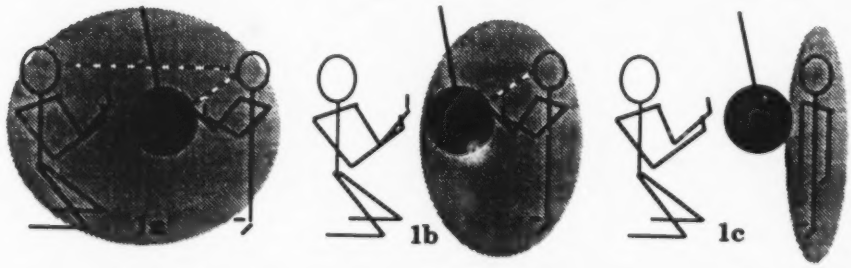

Figure 1, a, b,c. Three different ways in which a child might experience reality.

What do you do about more limited reality systems once you discover them?

We expand and transform limited reality systems and we enrich the child's repertoire by introducing new ones through spheric activity. When, through their work at the Center, the children learn to tolerate "stretching" their reality systems, or to accept new ones via repetitive spheres of activity, and can make transitions from one event to another without distress, their ability to cope with different life situations improves dramatically.

For example, for the child in Figure 1b that includes the ball but not the adult, we find ways to include the adult within the child's object system or change it from a child-object system to a child-adult-object system. For the child in Figure 1c we try to find out what gets in the way of the child's failure to react to the ball even when it hits the child. We determine if there are circumstances where the child *can* become aware of the ball: Some disordered children, for example, become more aware of an object when it approaches very slowly, others when they have repeated opportunity to push the ball.

For children whose reality does not include simple systems such as climbing up stairs to go down a slide, we introduce a repetitive sphere of activity that guides the child up the steps, to sit and to slide down and repeat the sequence. To help the child succeed we may pace the activity quite rapidly so that the child can connect one part of it with another and, eventually, own the system.

How do you help the children generalize what they learn at the Center to the home?

We build in the ability to generalize learning by the way we teach particular functions. For example, suppose a child is being taught to put cups on cup hooks. First, the worker helps the child put the cup on the hook by working hand-over-hand until the child can do this without support. Then, the worker moves about a foot or two away from the child so that the child must turn toward the adult to get the cup and then turn toward the cup hooks. Ultimately, the child learns to perform the cup-on-hook task while accepting cups of varied shapes and colors from different locations, presented in different positions, and presented by different people. This learning — occurring with the help of at least one parent — makes it possible for the child to perform such tasks at school, at home and elsewhere.

How do you deal with tantrums and other asocial behavior?

We view tantrums as a failure in the child's ability to cope with people or things in his or her surroundings. We try to understand the meaning of the tantrum — since this varies from child to child. For one child it may come about because he or she cannot cope with the shift from one situation to another and needs help with this. For another, it may stem from a feeling of loss triggered by a teacher turning to another child. Whatever the source of the tantrum, we do not deal with it by "time out" (placing the child in a space removed from teacher or other children). Instead, we try to meet the need being expressed, to signal transitions from one activity to another more clearly, and to use repetitive (and often reassuring) rituals to help the child reorganize. If all else fails we hold the child while talking to him or her calmly about what is happening in the classroom, what will happen next, etc.

What is different about how you teach language?

We find — in accord with other developmental theorists — that language begins with directed body action toward or with objects and events. We also find that when PDD children are placed on elevated boards 2 to 4 feet above the ground they become more aware of their bodies, better focused, and far more able to cope with obstacles or demands directly confronting them. Our research has shown that many children who cannot follow directions on the ground can do so in these elevated board situations. When we place obstacles in their paths and "narrate" what the children do as they climb over, in, through, across these obstacles, the children develop a repertoire of meanings which can readily be transferred to the ground. Since these "narratives" are accompanied by manual signs and words related to their actions the children soon become sign and word guided in these activities. For examples of these elevated board activities see Figure 2 below and the illustrations on pages 12 through 22.

The next section of this pamphlet provides a more in-depth look at the theory and its application at the Center.

Fig. 2. Child developing awareness of space near his body on the Swiss Cheese board. (*From* Miller A, Eller-Miller E: From Ritual to Repertoire: A Cognitive-Developmental Systems Approach with Behavior-Disordered Children. New York, John Wiley & Sons, 1989; with permission.)

Cognitive-Developmental Systems Theory in Pervasive Developmental Disorders†

*Arnold Miller, PhD**

Cognitive-developmental (C-D) systems theory assumes that all children are born with a disposition to make contact with, explore, cope with, communicate, and, ultimately, represent to themselves and others, the reality they experience. When, for any of a variety of reasons (e.g., cortical insult, structural anomalies in the brain, deprivation, hormonal deficiency, anoxia), that progression is affected, children may become stalled at an early stage of development or, if not completely stalled, progress to more advanced stages in an incomplete or distorted fashion. According to C-D systems theory, children with pervasive developmental disorders (PDD), present an impairment in the ability to react to and influence the world. Lacking a clear sense of the body or self in relation to the world, salient stimuli drive them into scattered or stereotypic behavior from which they cannot extricate themselves to establish functional systems.

The contrast between normal and disordered development becomes evident during the first year of life as one observes the system-forming capacity of both normal and disordered children. A normal infant begins with relatively closed systems in which the infant's body seems to blend into and conform with the contours of the mother,[16] but the infant soon learns to carry the mother–blending feeling internally even while moving away from the mother. The individuation that occurs at this time allows the child spontaneously to elaborate and expand the relationship both with the mother and with various objects and events in the immediate environment. In contrast, among many children with PDD this progression is not apparent. Either there is a breakdown in the system–forming process so that systems involving people or objects never develop or there is a "hardening" of transitory formations found in normal development, e.g., hand inspection and twiddling or intense object preoccupation.

In studying a particular child's reality systems, staff at our center try to determine the nature of systems the child brings to a new situation. They also evaluate the child's capacity to become engaged in new systems that the examiner introduces. Without an array of developmentally relevant interventions, the therapist would be limited to the child's aberrant systems.

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*Affiliate Professor, Frances L. Hiatt School of Psychology, Clark University, Worcester; Director, Language and Cognitive Development Center, Inc., Boston, Massachusetts

In developing the C-D systems model, the author drew on the work of Werner,[47] Werner and Kaplan,[43] Piaget,[34-37] Uexküll,[46] Lewin,[13,14] Schilder,[42,43] Mahler et al,[16] and Bertalanffy,[1] among others, as well as from clinical and experimental studies conducted by the author and associates.[19-30] Before describing interventions that derive from the theory, let us briefly consider several stages through which children must pass and how reality is structured during the earliest stage by both normal and pervasively disordered children.

SIGN STAGE OF DEVELOPMENT

C-D systems theory maintains that infants develop from largely stimulus-dominated organisms with a range of "part-systems" (sign stage) to individuals capable of representing reality to themselves and others (symbol stage) as the culmination of a series of liberations from the "pull" exerted by the immediate surroundings. The terms *sign* (0 – 18 months), *symbolic sign* (18 months to 6 years), and *symbol* (6 years and older) characterize different stages of liberation while reflecting an element of continuity essential to development. The stages are qualitatively distinct—with each earlier stage prerequisite to the next—but the prior stages also actively contribute to the achievement of later stages. In this article, particular attention is paid the sign stage because it is during this stage that aberrations in the normal developmental progression that lead to PDD in children first become apparent.

Sign Stage (0 – 18 months)

The sign stage is the period in which the child's behavior and experience of reality are largely dictated by the stimulus properties of objects and events in the immediate surroundings. During the first 10–12 months of this stage the child begins to establish relationships with caregivers, the distinction between body and world, eye-hand-object coordination, and reality systems composed of actions toward people, objects, and events. During the last 6 – 8 months of this period, as the child becomes mobile, inner driven intentions begin to dominate over externally driven behavior.

The term *sign* is used to characterize this initial stage because the first functional reality systems form through signs or signals. All signs have in common both an imperative quality and the requirement of a single-track response, whether the infant is reacting to the sign or producing the sign. For example, when the nipple is the sign, the single-track response is sucking the nipple. When the nursing infant's cry of distress or groping for the nipple is the sign, the single-track response related to that sign is the mother's postural adjustment so that the nipple may more readily be taken into the mouth.

Just as the small infant is dominated by the sign or signal properties of objects or events, so are many pervasively disordered children, but at ages 3 and older. For example, while a normal 3 year old can play with blocks in a variety of ways, can accept assistance from the adult and can turn away from the blocks and then return to them, none of this is possible for a sign-dominated child. Such a disturbed child may be so captured by one property of the blocks — their flat ends — that he or she feels compelled to build a structure in which one flat end abuts another. Consequently, the structure consists only of a row of blocks that the child extends by scrambling with single-minded intensity to add another block to the end of the structure. So intent is the child on adding to the structure through his or her own efforts that a block offered by the adult is ignored—the child's back turned toward the intruder—while he or she continues to extend the row of blocks until it reaches the wall. Confronted by the wall, the child makes a right angle with the next block along the wall and continues until there are no more blocks. Then the child rocks back and forth while twiddling fingers in front of the eyes.

Given such domination by the sign or signal properties of objects and events, how may one best help such children extricate themselves so that they can address reality more appropriately? The answer is found in the study of how normal infants first use their "part-systems" to join various aspects of reality and then later use them to begin to extricate themselves from the domination of signs and signals. These innately given part-systems consist of reflexive responses to various stimuli (sucking reflex, optokinetic reflex, grasping reflex, and so forth) as well as rhythmic stereotypies (repetitive kicking, rocking, waving, bouncing, banging, rubbing, scratching). The relevance of rhythmic stereotypies for later coordinated and goal-directed movement, is proposed by Wolff,[51, 52] a view later supported by the work of his former associate, Thelen.[45]

The Formation and Dynamics of Reality Systems During the Sign Stage

Reality systems refer to the child's organization and maintenance of various action-person, action-object, and action-event relations and their attendant stimulation in a way that initially ensures survival. When interrupted, these systems provide a compensatory, self-generated means of restoring themselves, which provides the framework for intentional action and the development of language. The formation of reality systems and the capacities inherent in them develop during the sign stage through a series of steps that are designated *orienting, engagement,* and *compensatory action phases.*

Orienting Phase. The orienting phase of the system-forming process enables the child to locate a salient object or event by turning

toward it and thus prepares the child for further action toward or with it. Although variously termed "attending" by Pillsbury,[38] "turning-to" by Goldstein,[8] or an "orienting reflex" by Pavlov[32] and Sokolov,[44] all writers agree on the innate, inadvertent, body-involving, and stimulation-enhancing effect of this directed response to salient facets of the environment. In figure-ground terms formulated by Rubin,[41] the most salient part of the field of stimulation becomes figural and all other surrounding circumstances become a ground for that figure. Thus, the infant orienting toward the nipple experiences it as a figure against a less distinct visual ground and, consequently, is better able to find the nipple.

During evaluations of pervasively disordered children, two kinds of abnormal orienting responses to salient stimuli are evident. In one kind of response — typical of children with autism — the child fails to orient toward a loud sound or to react to the presence of a large swinging ball approaching him or her; in another kind or response — characteristic of children with brain injury—the child may orient momentarily to a sound or the approach of a swinging ball but, as Goldstein [8] and Werner and Strauss [49] have shown, is immediately "caught" and diverted by extraneous stimuli. For both kinds of children, the inability to establish and maintain orientation toward a salient object or event works against the formation of new systems, as described below.

Engagement Phase. With normal children, the orienting transforms into an engagement phase that establishes the system when the orienting child follows through with actions toward a particular salient object or event. This follow-through enables the child to intimately experience, adjust to, or incorporate the unique properties of an object or event as these begin to unfold. Thus, the normal infant, after orienting to the touch of the nipple on the cheek, engages it with vigorous sucking movements. This changes the figure-ground relation that the child experiences; instead of nipple as figure, sucking-the-nipple becomes the figure (and thus the system). Once formed, the action-object sequence that makes up the system can be triggered readily by events that have accompanied the infant's engagement with nursing. For example, because the caregiver's crooning, stroking, and approach to the infant have become part of the nursing system, they are able, independently, to trigger sucking. With older normal children, engagement — and thus system forming — is evident in a child who, after orienting toward a swinging ball, can engage it by pushing it or swinging on it. The swinging ball is then known not merely as something to "turn toward" but as something for pushing or hanging on.

Rhythmic stereotypies become reality systems when, following orienting toward a particular event (such as the caregiver's appearance), the excited infant produces a particular response such as repetitive arm waving that becomes consistently related to the caregiver's appearance. At other times random rhythmic behavior becomes a system when it produces

an effect that the infant seeks to repeat. This was evident when Piaget's[58] son, in the course of waving his arms while holding an implement, happened to hit the bassinet's wicker cover, making a distinctive sound that he subsequently tried to reproduce by waving his arms in the same manner. As with reflexive reactions, as soon as the system forms, that is, as the child relates his waving arms to a particular outcome, the figural experience of the child changes. Whereas at first only the scratching sound was figural, once the system forms, arm waving *and* sound become a composite figure in a system that the child needs to maintain.

One important aspect of these newly formed systems is the quality of volition they suggest as the infants try repetitively to bring about certain outcomes, whether this entails bringing mother closer through repetitive arm waving or bringing about a certain sound through body movements. Closer study, however, reveals that the "intention" is restricted to the stimulus circumstances that triggered the formation of the original system. In contrast, true intention would be evident in a child who, unlike Piaget's son, could test the soundmaking properties of various parts of the bassinet without being bound by a system to a particular location. Nevertheless, as the next section indicates, the seeds of true intention are inherent in these more restricted systems but become evident only as the systems become interrupted. Such interruptions trigger the compensatory action phase that makes true intention possible.

The Development of Intention During the Sign Stage

C-D systems theory proposes that both intention and representation begin to develop within the *compensatory action phase* of the system process, a phase that is triggered by the interruption of an ongoing system (the object part of the system abruptly disappears or changes its dynamic). The theoretical model concerning interruption, buttressed by findings from a variety of developmental and experimental sources, including Mandler[17,18] Rickers-Ovsiankina,[60] and Zeigarnik,[83] asserts that the interruption of a system results in the child's disposition to compensatorily restore, maintain, or continue the system by repetitively producing the body activity that was part of the original action-object system.

C-D systems theory maintains that intentional behavior develops through such repetitive, compensatory activity. For example, a child repetitively throwing small objects may, if interrupted by removing all small objects, continue the throwing action even without the objects, as if performing these actions will restore the complete throwing-objects system. If, as Schilder[73] states, intentional action requires the dual awareness that one is acting with one's body and that there is an object toward which the action is directed, then such compensatory activity begins to meet these criteria. Awareness of compensatory body activity (the throwing) develops

because, no longer confounded with the object or event (the small objects) that first triggered the repetitive behavior, the child must orient toward and engage with his or her own body activity because it provides the most salient source of stimulation available. As this happens, the child becomes aware of these actions as coming from his or her own body. Further, because the compensatory body activity maintains the original object or event orientation (toward small objects) even though that object or event is no longer physically present, the child gains a sense of how his or her body actions relate to that object.

An example has been provided by Pavlovitch[20] in the case of a 5-month-old boy who continued to perform compensatory clicking and smacking sounds when the pacifier dropped from his mouth (interruption) related to and directed toward getting back the dropped pacifier. In the same manner, after Piaget's daughter Jacqueline, at 8 months, 9 days, formed a system that consisted of her repeatedly arching herself upward with weight on shoulder blades and feet and then dropping each time her father moved a plate in front of her eyes, she persisted, once the plate movement was interrupted, by continuing "to draw herself up (and drop) five or six times more, while looking at the (motionless) object" (p. 238).[20]

As the child becomes progressively more aware that the compensatory reactions coming from the body are responsive to his or her intentions, rhythmic stereotypies may be transformed: Repetitive waving may become directed reaching, and rhythmic kicking may change into more intentional foot movements. The child may also creatively play — both with body parts and external objects — as when a small infant first inspects a foot, then waves it, bangs it, mouths it, and inspects it again before repeating the process. Later, having grasped the distinction between body and object, the infant between 8 and 12 months learns with an object in each hand to bang one against the other, to shift objects from one hand to the other, and to observe how dropped objects relate to the ground. Once crawling and toddling begin, the infant, seeing an interesting object a few feet away, moves toward it, examines the object by shaking and mouthing it, and then rapidly returns to the mother. Mahler et al [18] have brilliantly described this system-expanding process of moving out into the world, returning for "refueling" from the mother, and then venturing further. In this way the small child not only begins to map spaces between mother, self, and objects further from the body, but also achieves self-awareness in relation to the mother and to objects.

Toward the end of the sign stage (10 to 18 months), reality systems grow in complexity. The child now puts one object inside another, tries to put things together and pull them apart, and makes detours to get past a barrier to a desired object. Clearly, this new flexibility goes well beyond the unrelenting disposition to repeat what the signal properties of objects seem to require and, coupled with the ability to refuel, provides a framework for

intentional exploration of the world and thus a basis for subsequent development.

Unfortunately, children with system problems cannot, without assistance, achieve the intentional and spontaneous relations involving objects and people so evident among normal children. Consequently, the task for the therapist is to find the right combination of interventions to help the child form, expand, and connect object and people systems with each other in a manner comparable to that found among normal children. Indispensable to this effort is the careful evaluation of the systems and system-forming capabilities of each disordered child.

EVALUATION OF REALITY SYSTEMS: THE UMWELT ASSESSMENT

An *Umwelt* — following Uexkull's[4] use of the term — refers to the subjective "world around one," i.e., the unique reality constructed by each child and within which the child functions. An Umwelt Assessment, therefore, is an effort to sort out the nature of this reality in order to introduce the interventions most helpful in resolving a particular child's reality problems.

The tasks chosen for the Umwelt Assessment tap both earlier and more advanced stages of development and involve relatively familiar situations that require the child to cope with them. The *expandable* nature of each task becomes apparent as a child interacts with it and the person introducing it. For example, in the most expanded reality of the Swinging Ball task, the child notices the adult repetitively swinging a ball toward him or her and enters into a game whereby the two alternately push the swinging ball back and forth. To take part in such a game, the child must have an awareness of the adult, an awareness of the moving ball, and a knowledge of the social system that makes adult-child play with the swinging ball possible. A child who has not achieved this most expanded reality may show a more circumscribed reality system. Such a child may, for example, push the ball away each time it comes *without* noticing the adult who is sending it. Or, even more circumscribed, a child may react to the ball only when it bumps into his or her body. Finally, most removed, a child may not notice or react to the ball even when it does collide with the body (see Figure 1).

Two general kinds of responses are quite common with this task. In one, characterized by children with *closed-system disorders,* the child, preoccupied with the space immediately around his or her body, may show little or no ability to track the ball and is repeatedly surprised as the ball looms closer. An important prognostic indication is whether the child learns—either with repeated approaches of the ball or with

assistance — to coordinate body activity with the ball's arrival. Children who learn to do so within the assessment typically respond more rapidly to intervention than those who do not. Sometimes a child who is not responding to the ball shows a tendency, following the *interruption* of hand-over-hand assistance, to slowly lift a hand in the direction of the ball — positive indication of a beginning ability to cope with the object.

Children with *system-forming disorders* tend to orient in scattered fashion to various aspects of the surroundings but rarely move beyond orienting to significant engagement that could lead to better coping. With the swinging ball task, such a child often tracks the ball as it moves closer in one part of its trajectory but then loses it entirely as it arcs away. Once the ball is spotted moving nearer, the child often self-protectively — but in a delayed manner — lifts the arms. Parents often have to hold such children in place or, "pulled" by some other transient stimulus, they would leave the situation.

The Anticipation Board task also illustrates how a disordered child's reality systems may be inferred. The task for the child is to climb over the barrier to get to the beckoning and calling parent. As Figure 3 shows, the diagonal board is a low barrier to the parent when it is farthest away and a higher one as it approaches the parent. The diagonal placement of the barrier results in the child's having most room to walk when farthest away but progressively less room when nearing the parent. Thus, it is advantageous for the child to anticipate the problem and step over the board as early in the sequence as possible. This is what normal 2 or 3 year olds do.

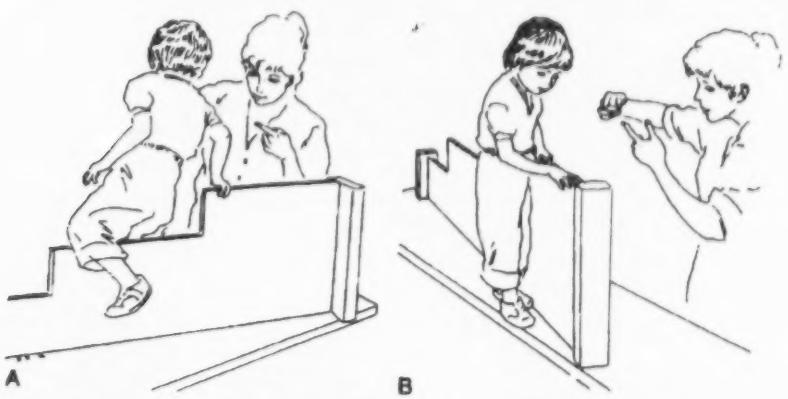

Figure 3. The anticipation board. Child (A) successfully crosses and (B) fails to cross over and reach the parent. (*From* Miller A, Eller-Miller E: From Ritual to Repertoire: A Cognitive-Developmental Systems Approach with Behavior-Disordered Children. New York, John Wiley & Sons, 1989; with permission.)

In contrast, an autistic child with a closed-system disorder often never looks at the parent but follows the diagonal barrier until there is no further room to go without falling off the structure. Whereas the behavior of the normal child demonstrates the ability to interconnect two systems — board situation and relation with parent — the closed-system child demonstrates how the impinging barrier dominates his or her system functioning.

A child with a closed-system disorder presenting stereotypic behavior with objects, also requires staff to determine how permeable these systems are and how readily they can be expanded. For example, if it is noted during the Stacking Cups and Bowls task that the child can stack cups in the upright position, it is also necessary to determine if he or she can stack them upside down. Then, while stacking cups right side up, the child is presented with a cup upside down to determine whether he or she turns the cup for right-side-up stacking or — like many children with severe closed-system disorders — futilely pushes the upside-down cup against the right-side-up cup in an effort to get it to stack.

Related questions that are asked concern the extent to which the closed-system child acknowledges the existence of another. For example, does the child during the Blocks task require that only he or she pick up the blocks being stacked, or can the child accept a block from the examiner? Beyond this, can the child tolerate having the examiner modify or contribute to the block structure being built?

Other important features of children's systems concern the ease with which they form and expand them. Both features may be evaluated on the Steps-Slide task. Here, the child must walk up steps placed at a right angle to the slide, sit down, slide to the bottom, get up, turn toward the starting position, and then repeat the sequence. A normal 3 year old almost immediately integrates the varied components and then begins spontaneously to expand the system by going down the slide headfirst, sideways, backward, and so forth. The child also shows no difficulty including the blocks (blocks go down before the child) and other expansions within the slide sphere. In contrast, a disordered child with a closed-system disorder may need guidance and support every step of the way. Reaching the bottom of the slide, the child may have to be turned toward the steps; after climbing the steps, the child must be shown how to sit down. Even after all parts of the sphere are integrated into a system that the child has internalized, the closed-system child has great difficulty accepting expansions within the system.

The areas of a child's developmental status that the Umwelt Assessment tasks help clarify are body schema development, coping with the environment, social contact, and representation/communication. In the next section, methods of correcting the system deficits uncovered in these areas are considered.

CORRECTING DEVELOPMENTAL DYSFUNCTIONS

To correct the various deficits alluded to earlier, C-D systems theory guides the therapist in the use of spheres — deliberately established repetitive sequences — that, at first, closely stimulate nonfunctional rhythmic stereotypies. Spheres are effective because the therapist can use them to help the child build constructions that the child cannot spontaneously achieve. Often introduced by hand-over-hand guidance of the child, spheres require the child to perform repetitively a particular activity while the therapist carefully uses those gestural signs and words directly related to the child's activity.

Spheres are designed to meet a child's developmental needs. For example, if a child is excessively reactive to many aspects of the environment and insufficiently reactive to any one aspect, spheres are set up that emphasize greater engagement with that one particular object or event. Alternatively, a child who is overly involved with single objects learns through spheric activity to establish relations between two or more objects. For the child lacking object permanence, a sphere may be designed that incorporates the appearance and disappearance of an object, a child who does not understand the instrumental ability of his or her own hands or body may be assigned causal spheres that require repetitively pushing over objects or pounding pegs through holes in a pounding board.

Spheres are also developed to establish social interaction for children who have difficulty making contact with others. An early interactive sphere may consist of repetitive, mutual touching of the child's cheek by the therapist and of the therapist's cheek by the child (Fig. 4).

Figure 4. Mutual touching sphere to encourage interaction.
(*From* Miller A, Eller-Miller E: From Ritual to Repertoire: A Cognitive-Developmental Systems Approach with Behavior-Disordered Children. New York, John Wiley & Sons, 1989; with permission.)

At first these spheres are completely controlled by the worker. Subsequently, through selective interruptions, the child learns to initiate and then to participate reciprocally in spheres. As spheres become internalized, they become systems.

At our center therapists use three kinds of spheres: *mini-*, *integrative*, and *multispheres*.

Minispheres. Minispheres were designed to substitute for the normal infant's spontaneous capacity to explore and expand the knowledge of objects and their relations in the immediate environment. Minispheres develop when the therapist repetitively introduces a single, coherent function around an object or event that can be systematically expanded by varying position, location, and people involved in the sequence. When a child, following interruption, seeks to complete the sphere and can perform it with all possible expansions, it becomes an internalized system. A worker tries to select as minispheres those activities within reach of the child's capacity to perform and those that, when developed into systems, the child can use and recognize in the context of normal, everyday behavior. Thus, for example, to establish the concept of a cup, various cup minispheres may entail pouring water from a cup, stacking cups, hanging a cup on a hook, and so forth; to establish knowledge of a ramp or a set of stairs, minispheres may be organized around going up and down a ramp or stairs in different ways.

Integrative Spheres. Between 8 and 10 months of age the infant can use intervening behaviors to achieve goals. The child who pulls a cloth to one side to get a desired object or the child who pulls the hand of an adult toward an unreachable object demonstrates the capacity to use and integrate an intermediate means in the service of a desired goal. A bit later this same instrumental capacity is evident in the child's ability to use tools — a string attached to an object or a stick — or to make a detour around an obstacle[15] to reach desired objects.

This critical capacity to mediate behavior may not occur at all or may occur only to a limited extent among children with PDD. To remedy this deficiency, the therapist helps the child combine minispheres in a way that leads from the beginning to the end of a task. Any complex task with the goal not immediately in sight requires a degree of mediation and inner planning. A child who is planning to go down a slide must *first* grasp the notion that there are steps to be climbed before he or she can slide down. In that sense, the stairs are the necessary instrument that mediates going down the slide. Through integrative spheres the system-disordered child learns to cope with familiar sequences — such as cleaning the table, washing and drying dishes, or putting food on shelves — that are naturally linked together in service of completing a particular task.

Multispheres. Autistic children with closed-system disorders have difficultly relating one object or event to another. Typically, when they shift from one thing to another they lose touch with the first thing — an "out of sight, out of mind" phenomenon. Multipsheres are designed to help disordered children solve this problem. Multispheres closely simulate the structure of certain real-life situations, as when a child interrupts a game to perform a chore but then resumes the game without difficulty. The capacity for such shifts between one system and another occurs quite early (around 7 months) as infants engage with an object, turn away from it, and then return to it with the expectation that it has not disappeared. As Piaget[36] put it, "The child returns of his own accord to the position and gestures necessary for the resumption of the interrupted act and (in so doing) endows the objects thus rediscovered and recognized with permanence" (p. 24).

To provide an example, Fred, an autistic child, was given the task of picking up a pitcher filled with water (Station l) and then walking to Station 2, where he was supposed to pour it over a waterwheel in a bucket (first minisphere). The second minisphere required Fred to walk to Station 3 to pick up a ball and continue to Station 4 to drop or throw the ball into a basket.

Fred seemed confused by the complexity of shifting from one sphere to another. The approach that eventually led to Fred's ability to perform multipsheres entailed systematically interrupting Fred's behavior at the point of *maximal tension* in one minisphere and then guiding Fred to another sphere. The rationale for this procedure is as follows: When the first sphere is interrupted just as Fred is ready to pour water over the waterwheel, the child experiences, in Lewinian[13,14] terms, a tension state related to the need to complete that first sphere (pouring water over waterwheel). By maintaining that tension state while having the child become engaged with an entirely different sphere (throwing ball in basket), the first sphere continues to remain "alive" in the child's psychological economy even during the engagement with the second sphere. *This duality of experience begins to make it possible for the child to relate one sphere to another.* After a number of cycles involving the two spheres, the child demonstrates, by glancing at the second sphere while still engaged by the first, a sense of relation between the two spheres.

Developing the Body Schema

Body schema problems often become evident when a disordered child is required to use his or her body in a new way. This was evident with Kevin, an 8-year-old autistic boy who was taught to swim by the author. After much repetitive work, the boy finally learned to move his arms for the "dog paddle." However, he would use only his arms, allowing his

extended legs to settle gradually to the bottom. Turned on his back so he could see his legs, he could kick, but as soon as he turned over on his stomach he failed completely to move his legs. Only after repetitive spheres entailing experience of the therapist moving his legs vigorously in rhythm with "kick . . . kick . . . kick!" commands and with the help of his looking over his shoulder to see what his legs were doing, was he finally able to kick on command without seeing his legs. Clearly, Kevin had developed a partial body schema or he could not have deliberately moved his legs under any condition. Yet his awareness of leg function was largely limited to those conditions in which he could see as well as feel his legs' actions. Moving his legs on command when he could not see them required a more developed body schema than he had; it required an internalized notion of how his arms and legs worked solely on the basis of proprioception. Once he had incorporated kicking sensations into his body schema, he could kick in any position without having to see his legs.

Another common body schema problem among pervasively disordered children is the lack of awareness of how one side of the body differs from the other (Fig. 5a), or how eyes, hands, and feet work together to solve certain problems. To correct these problems, the child participates in repetitive spheres involving parallel boards situated 3 feet above the ground. On one structure (Fig. 5b), the child is initially unable to move; he or she learns to do so (and in so doing distinguishes one side of the body from the other) by shifting weight from one side to the other in order to unweight one foot so it might be moved forward. This procedure is repeated for the other foot. As the child learns to move each side of the body deliberately on this structure, obstacles are placed so that the child must perform a different movement for each foot, such as pulling a foot back before lifting it over the obstacle on one side of the board and then merely lifting the other foot over the obstacle.

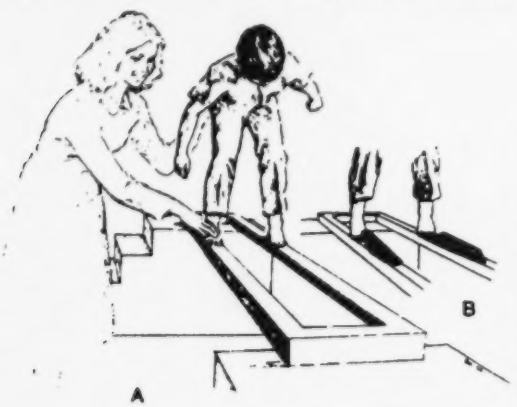

Figure 5. *A*, Parallel boards used to help differentiate sides of the body. *B*, Obstacles added to help accent awareness of feet. (*From* Miller A, Eller-Miller E: From Ritual to Repertoire: A Cognitive-Developmental Systems Approach with Behavior-Disordered Children. New York, John Wiley & Sons, 1989; with permission.)

For children who lack awareness of their body boundaries, another device, the Template Tunnel (Fig. 6) is helpful. This tunnel requires the child to adjust the body to different templates in order to pass through. While turning and twisting to accommodate to the different templates, the child must attend to and note the location of body boundaries — shoulders, hips, legs, and so forth.

Coping with Surroundings

One of the major problems presented by many pervasively disordered children is tantrums. The center's method of coping with tantrums depends on the need the child is expressing and the kind of system disorder a child presents. For example, with a child characterized by a closed-system disorder, the tantrum is usually triggered by new circumstances that are too disparate from the child's existing systems. With such a child, the introduction of rituals is often effective. One tantrumming, closed-system child responded very well to a crayon scribbling sphere or ritual in which the teacher placed the crayon in his hand and helped him make repetitive marks. Then, to bring him into emotional contact with her, she began to hand him different-colored crayons. Within 2 or 3 minutes the child became calm and could be brought back into the drawing program going on in the classroom at the time.

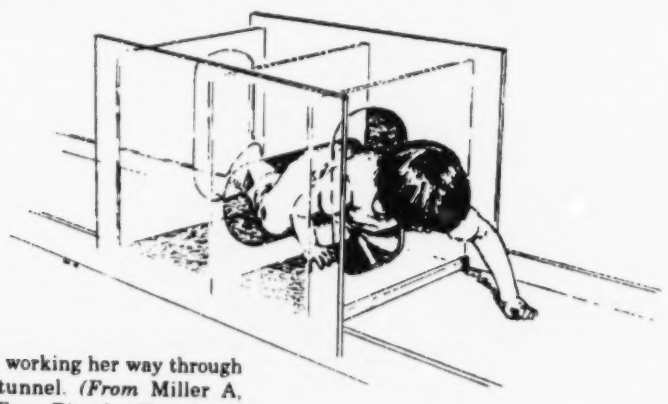

Figure 6. Child working her way through the template tunnel. (*From* Miller A, Eller-Miller E: From Ritual to Repertoire: A Cognitive-Developmental Systems Approach with Behavior-Disordered Children. New York, John Wiley & Sons, 1989; with permission.)

Another common issue concerns the best method for helping a child with PDD develop a concept of space and how one object relates to another. Fred, an autistic child, had little knowledge of space, as

evidenced by his getting lost each time he tried to go from one place to another. Consequently, he required intervention with minispheres that could help him achieve knowledge of objects in a controlled space via the same leaving-returning process that normal infants achieve spontaneously. In that context, the first task was to free Fred's hands from their throwing compulsion while orienting him in space. The therapist sought to help Fred develop more varied and intentional body action toward objects by transforming his compulsive throwing into a deliberate picking up and dropping of objects at specific locations on the elevated square (Fig. 7). The elevated square was chosen because it structured his behavior—requiring him always to return to his starting position — and provided stations at which different tasks (minispheres) might be performed.

Once particular spaces were brought into relation with each other, they became familiar to him as spaces within which deliberate actions with objects became possible. To help Fred begin to "own" his actions, all minispheres were periodically interrupted at the point of maximal tension (just before dropping or picking up an object) so that Fred's compensatory disposition to complete the sphere could contribute to intentional behavior. Following the transformation of throwing into dropping, the therapist guided Fred into throw-dropping a variety of objects into specific containers. Subsequently, Fred extended his repertoire further by acquiring minispheres that allowed him to put cups on hooks, send cars down ramps, and so forth. An extensive array of additional tasks, such as the Swiss Cheese Board task and the Broken Objects task, are presented in Miller and Eller-Miller.[30]

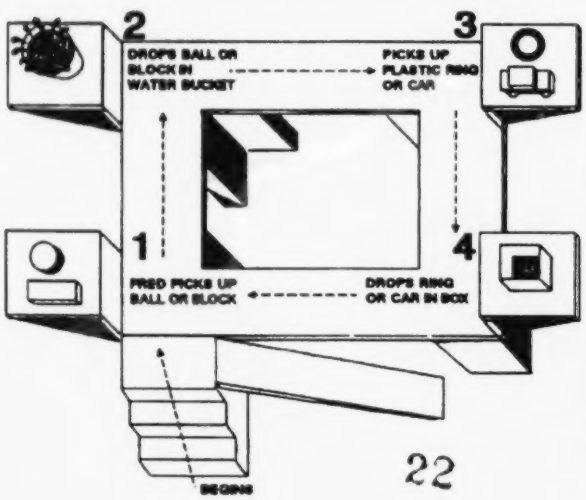

Figure 7. Schematic of the Elevated Square indicating stations at which child picks up and drops objects. (*From* Miller A, Eller-Miller E: From Ritual to Repertoire: A Cognitive-Developmental Systems Approach with Behavior-Disordered Children. New York, John Wiley & Sons, 1989; with permission.)

Developing Social Contact

Unlike newborn babies, who can adaptively signal the caregiver via a broad range of emotional expression,[9,39] disordered children are often affectively inert. Lacking both affective expression and preverbal communicative gestures — reaching to be picked up, pointing[6,31,50] — they remain emotionally isolated and often seem to prefer objects to people. Fortunately, there is one area — response to contagion — common to both normal and disordered children that may be drawn on to establish interactive and, eventually, social systems involving others. At the Center, a variety of spheric, contagious procedures have been developed to foster such contact and to move the child toward increasingly more appropriate exchanges with others. For example, with the use of a *rocking sphere,* many disordered children who rock by themselves can transform it into an interpersonal activity. The therapist or caregiver sits on a stool, with the child either lying infant-style in the adult's arms or sitting astride the adult's legs. Typically, the adult's arms and hands are supporting the back and head of the child. The therapist's intent is to establish a rocking game by starting slowly with a quiet voice, gradually building up the rocking tempo and the voice to a level of excitement, and then abruptly interrupting the motion. Prior to interrupting the sphere, the therapist observes the child for signs that he or she is beginning to anticipate the forward rocking motion. When this is evident, the adult, on returning to the leaning-back position, abruptly interrupts all motion. If the child responds to interruption by seeking to continue the rocking sequence (compensatory response) — as shown by intense eye contact, incipient rocking motion, or any sounds that the adult has been producing — then the child is successfully internalizing the sphere *with another person.* When successful, the sphere may be expanded to a rocking chair and eventually to a swing.

The *bouncing sphere* operates in similar fashion. The therapist holding the child under the arms, helps the child bounce in place. After starting slowly, the worker quickens the pace and builds in excitement and then suddenly interrupts to determine if the child seeks to continue the system. Typically, the sphere is accompanied by rhythmic comments such as "Up, up, up we go!" in synchrony with the bouncing movements. Expansions may include performing the sphere with mother or father. As awareness of others increases through the use of such procedures, the role of language in developing more complex social systems becomes increasingly important.

Developing Communication and Representation

One of the most important ways of developing communication is first to have the pervasively disordered child become sign and word guided. Following this, many disordered children learn to use both signs and

spoken words to communicate their intentions. The use of signs adapted from the American Sign Language for the deaf with spoken language derives directly from the view that gesture language is a transitional phase in the development of language and thus is initially more available to many nonverbal disordered children than conventional spoken language. One of the reasons signs are more available is that they serve as a "bridge" between the spoken word and its referent. This bridge, consisting of the resemblance between many signs and their referents, makes signs far more available to disordered children than the arbitrary forms of spoken words. The use of signs paired with spoken words permits many disordered children to understand and be guided by words when these are used without signs.

In an early study conducted at this center,[7] it was found that 19 nonverbal autistic children, previously unable to follow directions presented by either sign or spoken word, could do so after training with sign language used in the context of relevant situations both on elevated boards and in everyday situations. The manner in which signs and spoken words are directly related to the child's functional actions on elevated boards is illustrated in Figure 8. Over the years the effectiveness of relating signs and words to action and object referents has been confirmed and extended by a number of researchers, including Bonvillian et al[2] Brown,[4] Creedon,[5] and Konstantareas and coworkers.[10-12]

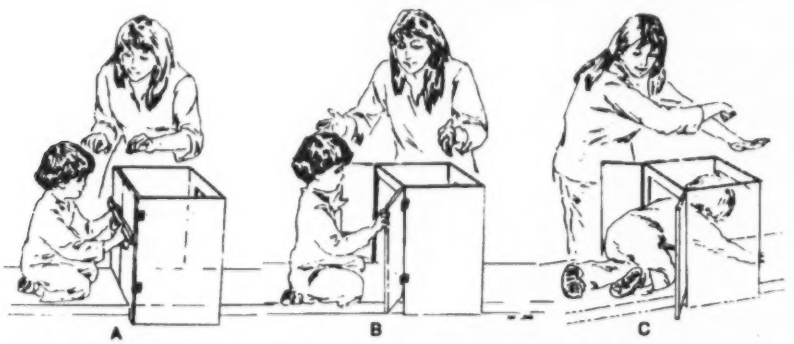

Figure 8. Child relating functional body actions to signs and words in an integrative sphere on the primary board. *A*, Pick up; *B*, open; *C*, through. (*From* Miller, A, Eller-Miller E: From Ritual to Repertoire: A Cognitive Developmental Systems Approach With Behavior-Disordered Children. New York, John Wiley & Sons, 1989; with permission.)

Communication consists of the ability both to receive and to send messages. Developmentally, the ability to receive and be guided by messages — whether conveyed by gesture signs or spoken words — precedes the ability to send them. Often a contagious sphere that includes actions, signs, and words provides the first setting in which a disordered child understands and uses signs and words. For example,

Fred's first spoken words occurred in the context of a contagious alternating sphere involving Fred and his therapist in which first one and then the other rapidly got up or sat down or pulled the other as the therapist uttered or signed words and shifted unexpectedly from one command to another. In the course of numerous repetitions of the sphere, and while giggling with excitement, Fred for the first time at age 4.5 years began to take over the commands by appropriately signing and saying the words with the expectation that the therapist would follow his directions to "Get up!" or "Pull!" or "Sit down!"

With disordered children, sometimes the first spoken words emerge directly from a contagious sphere and sometimes from interruption of mini- or integrative spheres. For example, Fred produced his first conventional sign—for walk—after his therapist interrupted a walk-stop sphere that she had been developing for several weeks signing and saying "walk" and then "stop" as they walked and arrived at the therapy room. Often disordered children become sign- and word-guided within the interactive object-down sphere (Fig. 9). As the illustration shows, the terms "pick up" and "down" coupled with the names of different objects can be effectively introduced with a number of children via this sphere. For many disordered children, spoken words do not develop unless they have been previously guided by sign-words and have learned to use the signs in a functional manner.

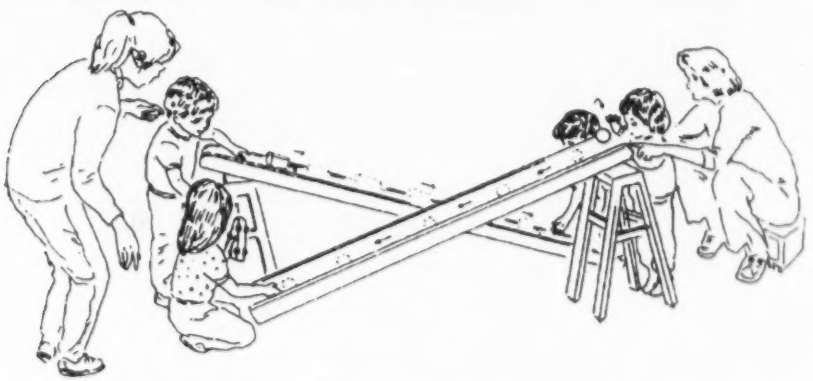

Figure 9. Interactive down-object sphere involving four children with varied objects. (*From* Miller, A, Eller-Miller E: From Ritual to Repertoire: A Cognitive Developmental Systems Approach With Behavior-Disordered Children. New York, John Wiley & Sons, 1989; with permission.)

Just as children with PDD often require manual signs as transitions from action-object relations to the use of spoken words, many require transitions before they can recognize pictures and printed words as meaningful symbols capable of representing objects and events.

All children — but particularly disordered children — experience another gap after the development of spoken language (symbolic-sign stage) when they first confront the arbitrary forms of printed words and are asked by teachers and parents to attribute specific object meanings to these forms. Then, just as some children have difficulty with the shift from object to picture, so others have difficulty with the shift from picture to printed word. Assisting children with this transition requires another set of strategies. These strategies derive from the observation that, unlike the iconic relation between picture and object, the forms of printed words do not resemble their referents. Therefore, before many children can understand that a printed word may convey the meaning of an object to which it bears no resemblance, they require an interim means of investing printed words with object meaning. In a series of experiments with associates,[22,24,28] it was demonstrated that children previously unable to find meaning in printed words could do so when provided a transition from picture to printed word form. This was first accomplished by having pictures and printed words fused on one side of a flash card that could be flipped to the other side, revealing the word in its conventional form. Subsequently, disordered children could identify these printed words in their conventional forms. These procedures have been developed further in the Symbol Accentuation Reading Program[29] so that, with the help of animated motion pictures to make the transition from picture to printed word and from letters to mouth movements, many disordered children previously unable to read and write have learned to do so.

INTEGRATING CENTER WITH HOME

Although the strategies described in this summary clearly help pervasively disordered children make important gains, by themselves they are insufficient. For the work of the center to have full impact, a close alliance must exist between the child's family and the center staff. Dramatic progress occurs most frequently when the reality systems developed at the center can be expanded to include comparable systems at home. Then a child has the opportunity to note that concepts developed in one place also have relevance at home and in other places.

Typically, parents are pleased to follow through on staff suggestions. Sometimes, however, parents' issues get in the way. This occurs when a parent — referred to diagnostically as a high support–low demand parent — assumes an extremely protective stance that precludes making appropriate demands on the child. Other times a parent — known as a high demand–low support parent — denies anything is wrong with the child and assumes a very tough, uncompromising stance that ignores the nature of the child's disorder entirely. Obviously, both

patterns work against a child's development; the most effective pattern, which the center encourages, is one of high support–high demand.

When counterproductive patterns impede work with a particular child, individual psychotherapy, group therapy, or family therapy at the center may be recommended. In addition, there are available to parents a variety of support groups for mothers, fathers, or both parents. The center also offers education groups on developmental or program issues, such as developing sign language skills for families of nonverbal disordered children.

The importance of the relationship between staff and families is suggested by the behavior of one child who was very responsive to and seemed to delight in being with his therapist but ignored her completely when she met him in the hallway with his classroom teacher or with his mother. Such behavior stems from the child having embedded each person in his or her respective system. Thus, except in her therapeutic context, the therapist could not exist. Obviously, progress for this child would include achieving the ability to relate to his therapist and others as people independent of their location, an outcome that requires careful planning to interconnect therapeutic, teacher, and home systems.

DISCUSSION

In this section we answer additional questions asked about LCDC's program:

What is the curriculum for school age nonverbal or limited verbal PDD children?

As Table 1 shows, the typical day for a school child with PDD emphasizes body awareness, coping with surroundings, interacting with adults and peers, communication and representation.

All children in this group will spend 35 – 40 minutes each day working on the elevated board structures and 30 minutes each day on the sign and spoken language program. All activities have a strong language component since the teachers narrate (describe like a sports announcer) every functional activity the child performs. In addition, during the course of the week, each child is scheduled for C-D systems therapy for 45 minutes with therapist and parent; for 30 minutes with speech and language therapist and 30 minutes a week with a movement therapist. Both speech/language and movement therapists also conduct weekly group sessions lasting 30 minutes each.

What determines how well a child will do in the LCDC program?

Our clinical experience suggests that there are five important factors which determine a child's progress: These are the child's age, neurological

Table 1. **Typical Daily Curriculum for PDD Children**

Time	Activity	Areas Developed
	Orienting	
8:30	Handing over the child	Interaction
	Massage/compression with voice modulation	Body awareness
	Rough and Tumble and selective tickling	Body awareness
	Narrating and predicting imminent events	Communication
	Reciprocal touching, exploration and part naming	Interaction
	Tableau Calendar for structured transitions	Interaction
	From One-on-One to Group	
9:00	Circle spheres—contagious activity (teachers and children) ("This is the way we pat our head [rub nose, run, walk, jump, fall, stamp feet, etc.]")	Interaction Body awareness Communication
	Sign and Spoken Language Program	
9:30	Training Film I (action signs/words: *walk, run, jump, fall, come, go, stop*, etc.—receptive and expressive)	Communication Interaction
	Generalizing action concepts to other settings	
10:00	Toileting/Washing	Coping
	Snack Time	
10:20	Child uses signs/words *give, pour, eat, cookie, drink, spoon, fork*, etc., for desired objects/events	Coping Communication
	Elevated Board Spheres	
10:40	Using Bridge or Template Tunnel and combined board structures including Grand Central sphere	Body efficacy/ awareness
	Using multiple orienting to revitalize an inert system	Interaction Coping
	Reciprocal Spheres	
11: 15	Using Traveler with terms *push, open, pick up, close*	Interaction/Commun.
11 :45	Reciprocal ball pushing sphere	Interaction
12:00	Lunch	Coping
12:30	Rest Period	
	Cooperative Building Spheres	
1:00	Boards to build large and small Velcro house	Coping
	Cooperative repair of Broken Table and Chair	Interaction
	C-D Art Program	
1:30	Repetitive circles, lines and dots as minispheres and integrative spheres	Representation
	Symbolic Play Spheres	
2:00	Using Elevated board replicas (small) with dolls	Representation

status, relationship with parents, system characteristics and parental support–demand stance .

The Child's Age. The literature and our own experience clearly supports the view that children who begin intensive work at 3 years of age or younger do substantially better than those who come to us older. However, this finding must be qualified by the kinds of capacities a child possesses when work begins.

Neurological Involvement. Not surprisingly, the less damage to the brain the better the children do. Children with injury to specific areas of the brain affecting language, perception, and thinking processes have done well at the Center with the help of our specialized procedures. Children with more extensive injury — while improving significantly — have done less well.

Relationship. Children who have a special relationship with at least one parent have done better than those who begin without such a relationship. We consistently help parents make contact with children previously unavailable to them emotionally. However, the need to build or rebuild a special relationship with a parent or caretaker means that an important part of C-D systems work must be devoted to this task while cognitive and communication capacities are being developed.

System Characteristics. Among PDD children, those with closed-system disorders seem to progress more rapidly than those with system-forming disorders. Because only when the system is there can the child learn to expand and connect it, it follows that it will take longer for children with system- forming disorders to progress than children with closed-system disorders.

Parental Support-Demand Stance. We have repeatedly found that parents who assume a stance of high support – high demand with their child, have children who make significantly more gains than children whose parents are either overprotective (with insufficient demand) or overdemanding (with insufficient support) .

How much have children benefitted from the LCDC program?

We have had most success in bringing PDD children to near normal* functioning— sometimes performing academically at better than expected for their age —when they meet the criteria mentioned above. Since these criteria are met for only a proportion of the PDD children the Center accepts, it follows that outcomes vary. However, by reviewing outcomes of the 63 PDD children who have attended and then left the Center over the past 12 years, we gain a rough measure of the Center's effectiveness.

*The video documentary, **A Small Awakening**, illustrates one autistic child's progress toward normal functioning during 2.5 years in LCDC's program.

Of this group 48% (30 children) have returned to their public schools able to mainstream in some or all of the classes. Another 32% (20 children), although significantly improved, left the Center because of their age or other reasons and continued at another private school. The remaining 20% (13 children) — usually showing only modest gains — went to residential settings because the pressure they placed on their families became too great.

In closing we wish to stress that how human and competent the children become depends in large part on the determined and coordinated support for their human potential by all those who care for them.

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Address reprint requests to Arnold Miller, PhD
Language and Cognitive Development Center, Inc.,
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Dr. Reison, for information on LCDC's program for providing guidance and supervision to professionals and parents distant from the Center or its satellites.

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Arnold Miller, Ph.D., for information on LCDC's apprenticeship program for professionals seeking hands-on experience and supervision at LCDC during an agreed-upon period of time.

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Louise Ross, Ed.D., for information regarding LCDC's annual Continuing Education Program as well as the dissemination of materials.

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Suzanne Martel, M.A., for information about LCDC staff presenting the Cognitive-Developmental (C-D) Systems Approach in 1.5 to 2 hour presentations to professional and parent groups.

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From Ritual to Repertoire: A Cognitive Developmental Systems Approach with Behavior-Disordered Children, by Arnold Miller and Eileen Eller-Miller, John Wiley, 1989, 520 pages, illustrated.
Provides in-depth theory and practice guiding the LCDC program.

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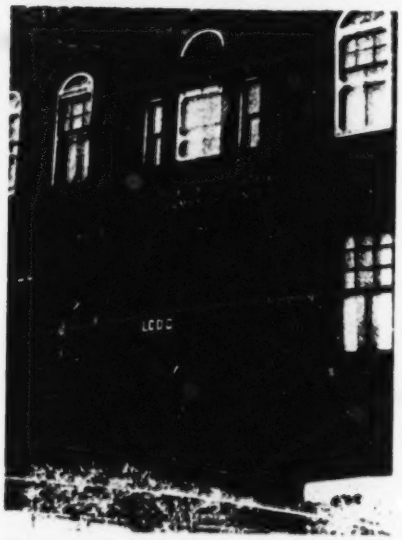

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